SPATIAL VARIABILITY OF SATURED SOIL HYDRAULIC CONDUCTIVITY IN THE REGION OF ARAGUAIA RIVER - BRAZIL

EDNALDO CARVALHO GUIMARÃES[1]; EMILIA HAMADA[2]; MARCO ANTONIO FERREIRA GOMES[2]

[1] Researcher, PhD, FAMAT/UFU/Uberlândia – Brazil. e-mail: egcg@ufu.br
[2] Researcher, PhD, EMBRAPA/Jaguariuna – Brazil

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ABSTRACT: This study evaluates the spatial variability of saturated hydraulic conductivity in the soil in an area of 51,850 ha at the headwaters of the Araguaia River MT/GO. This area is highly vulnerable because it is a location of recharging through natural water infiltration of the Guarani Aquifer System and an area of intense increases in agriculture since its adoption by growers in the last 30 years. Soil samples were collected at 383 points, geographically located by GPS. The samples were collected from depths of 0 - 20 cm and 60 - 80 cm. Exploratory statistics and box-plot were used in the descriptive analysis and semivariogram were constructed to determine the spatial model. The exploratory analysis showed that the mean hydraulic conductivity in the superficial layer was less than at the level of 60-80 cm; however, the greatest variability evaluated with a coefficient of variation also was from this layer. Data tended towards a normal distribution. These results can be explained by the greater soil compaction in the superficial layer. The semivariogram models, adjusted for the two layers, were exponential and demonstrated moderate and strong dependence, with ranges of 5000 and 3000 utm respectively. It was concluded that soil use is influencing the spatial distribution model of the hydraulic conductivity in the region.
KEYWORDS: semivariogram, hydraulic conductivity, spatial dependence, soils